Biomolecules Review

1. Identify the type of biochemical reaction occurring in each of the following (dehydration synthesis or hydrolysis):

a. 3 fatty acids + glycerol --> fat + 3 water **DEHYDRATION SYNTHESIS**

b. protein + water --> amino acid + amino acid **HYDROLYSIS**

c. polysaccharide + 2 water --> glucose + glucose + glucose **HYDROLYSIS**

d. amino acid + amino acid --> protein + water **DEHYDRATION SYNTHESIS**

e. fat + 3 water --> 3 fatty acids + glycerol **HYDROLYSIS**

f. glucose + glucose + glucose --> polysaccharide + 2 water **DEHYDRATION SYNTHESIS**

2. How many bonds occur in each element:

a. carbon -  **4**

b. oxygen - **2**

c. nitrogen - **3**

d. hydrogen - **1**

3. Which biomolecule has the following functional groups?

a. COOH and OH - **LIPID (FAT)**

b. NH2 and COOH - **PROTEIN**

4. Name the monomers that make up the following polymers

a. protein **AMINO ACIDS**

b. lactose  **GALACTOSE AND GLUCOSE**

c. maltose **2 GLUCOSE**

d. sucrose **GLUCOSE AND FRUCTOSE**

e. glycogen **LONG CHAIN OF GLUCOSE MOLECULES**

f. lipid **GLYCEROL AND 3 FATTY ACIDS**

5. Identify the Biomolecules of the Body that relates to the following:

a. Insulation - **FATS**

b. Muscles, antibodies, hemoglobin, enzymes - **PROTEINS**

c. Quick energy, blood sugar - **GLUCOSE**

d. Glycogen in liver- **LONG CHAINS OF GLUCOSE**

6. How many different amino acids are there? **20 (8 OF THEM ARE ESSENTIAL AND NEEDED BY DIET)**

7. What is the difference between starch and glycogen? **STARCH IS FOUND IN PLANTS, GLYCOGEN IN ANIMAL LIVER AND MUSCLE**

8. Why is the activity of an enzyme like a lock and key? **THE ENZYME FITS THE SUBSTRATE (MATERIAL BEING ACTED ON) LIKE A LOCK IN A KEY**

9. How are monosaccharides, disaccharides, and polysaccharides (starch, etc.) related to each other? **ALL CARBOHYDRATES ARE MADE OF MONOSACCHARIDES. DISACCHARIDES ARE MADE OF 2 MONOSACCHARIDES, AND POLYSACCHARIDES ARE LONG CHAINS OF THE MONOSACCHARIDE GLUCOSE**

10. Through the reactions of dehydration synthesis and hydrolysis, what important molecule is always part of the processes? **WATER – IT IS EITHER A PRODUCT OR A REACTANT**

11. Catalase is an example of an \_\_\_\_**ENZYME**\_\_\_\_. What kind of biomolecule is it? **PROTEIN**

12. Which biomolecule contains the largest amount of energy in its bonds?  **FATS**

13. How can an enzyme become unusable? **IF IT IS DESTROYED BY HEAT OR A CHANGE IN PH**

14.

a. What process would be used to put two monomer units together? **DEHYDRATION SYNTHESIS**

b. What are these monomer units called? **AMINO ACIDS**

c. What other molecule must be removed in order for the reaction to happen? **WATER**

